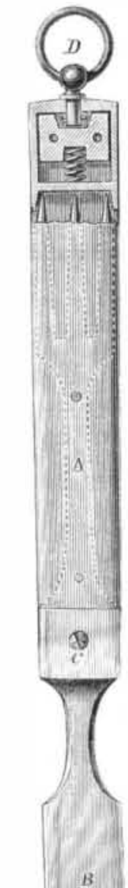
SUINE'S CULINARY INSTRUMENT.



The engraving represents an implement designed to subserve two or more purposes in culinary operations. It can be used as a lifting or steadying fork, or as a spatula or slice for lifting and turning fish, cakes, meats, omelets, etc. It is represented partially in section, and consists of a long handle, A, open at the side edges like a razor handle, the two sides being connected at the ends. The fork, shown by the dotted lines, and the blade, B, are of steel, in one piece, pivoted in the handle at C, so that it can be turned in either direction. At the upper end of the handle is a sliding plug sheath, shown in section, to which is attached a ring, D. By pulling on the ring the tension of the spiral spring is overcome, the sheath receded, and the blade or fork released, when the instrument can be transformed into a fork or slicer at will. The blade has rounding edges, the point being thin and square across.

It was patented through the Scientific American Patent Agency, Dec. 18, 1866, by P. L. Suine, Shirleysburgh, Pa., who will answer all letters of inquiry.

Central Fire of the Earth.

Our London cotemporary, the *Engineer,* discusses at great length the evidence of "fervent heat" with which the elements beneath the crust of our globe are melted, and transfers a wondrous scientific tale which has been running through the French press with solemn gravity. Some of our readers will perceive that, like the beetle's ball, the story has gained in size by being rolled across the Atlantic.

The story, as copied into the *Engineer,* runs thus: "Not far from the Falls of Niagara was a glacier, belonging to a company who realized enormous profits by the sale of the ice in the western cities during the summer months. A few days later than the Aspinwall explosion, an aurora borealis of magnificent proportions was observed wheeling its shafts several nights in succession in the northern sky, causing two lightning conductors on the top of the glacier(!) to emit long electrical flames of a bluish color. In the meantime a boiling noise was heard inside the glacier, accompanied with a disengagement of gas and occasional loud detonations. A captain of militia ventured to enter an opening in the ice with a light, when the glacier burst with an explosion that shook the whole country. Happily nobody was killed except the unfortunate captain, of whom not a trace could be found. The glacier contained 16,000 tuns of ice, and after the explosion there was a fall of lukewarm water over a space of 500 yards in diameter. The theory of the cause of the explosion is that the two lightning conductors on the glacier acted under the influence of the electricity as the two poles of a voltaic battery, and decomposed the ice into a mixture of oxygen and hydrogen gases, which of course exploded with resistless power on the introduction of a light."

FERRY ACROSS THE ENGLISH CHANNEL.

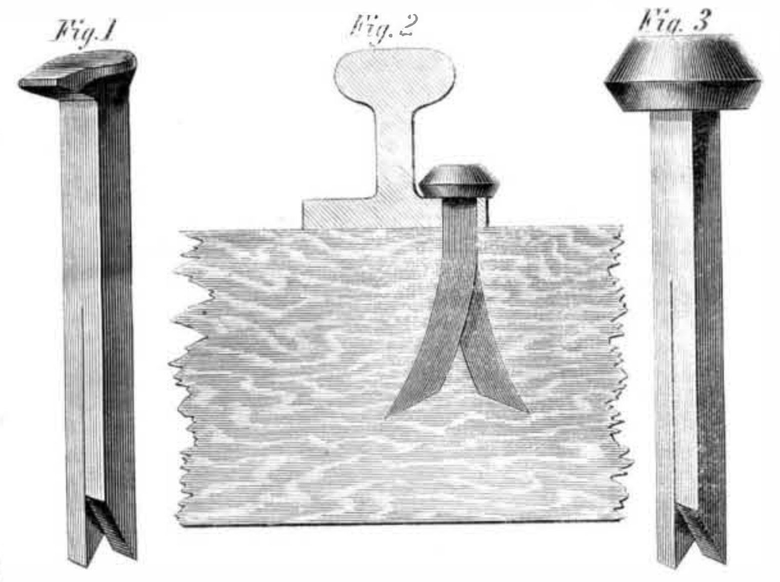
The proposition for a railroad ferry across the channel that divides England from the continent is by no means new, and it is not improbable that before many years it will have become an accomplished fact. Indeed, it is a matter of some surprise that this enterprise has not before this been ultimated into a reality. Of all the projects suggested, the tunnels of masonry, of iron, the sub-aqueous bridge, and the artificial islands, etc., that of the monster ferry appears to be the most practicable and feasible.

Engineering strongly recommends this plan, whether the boats employed are to carry a railway train with its passengers or not. It says: "It is a question of judgment how far we may go on increasing the size of our Channel steamboats. As a mere matter of construction we could make them of almost any size, even so that their length should form a respectable proportion of the whole distance between England and France. Our plans must be governed, however, by the probable traffic, and here, again, we are left to conjecture what increase of communication would follow a nearly total prevention of sea-sickness. We know that many of our ablest engineers, Mr. Hawkshaw among them, count so largely upon this increase as to believe that a tunnel, were it to cost ten or even fifteen millions, would eventually become a profitable undertaking. Yet even were the tunnel made, and supposing no apprehensions to exist as to its perfect security, it is not every one that would prefer a ride of twenty-five miles under the sea when he could cross over it in nearly the same time."

Engineering proposes boats 800 feet long with a beam of one-fifth or 160 feet, driven by four pairs of engines, each of 600 horse-power, working collectively to 12,000 indicated horse-power, and driving four wheels, the two pairs 300 feet apart. We believe with *Engineering* that boats so constructed and propelled would almost annihilate the proverbial miseries of the Channel passage; and, as it is a subject in which Americans have some interest, we sincerely hope the matter will be pushed forward by our enterprising cousins. Not unfrequently we hear the complaint that the passage from England to France is productive of more discomfort than a voyage across the Atlantic.

Improved Split Spikes.

Railroad spikes, as ordinarily constructed, are very liable to become loose by the jarring and trembling of the rails, also by contraction and expansion. The annexed engraving illustrates a split spike of a new construction, and one well calculated to retain its place in the sleeper until more than usual power is exerted to draw it out. The body and head of the spike are of the usual style. The body is split, as will be noticed by reference to the illustration, centrally and longitudinally, for about half of its length, and the ends of each prong are beveled on alternate sides, as shown clearly in Figs. 1 and 3. It will therefore be perceived that when the spike is driven into the sleeper the two prongs will diverge or turn outward, in a direction parallel with the plane of the split in the spike, as shown in Fig. 2; the chisel edges cut the way for each prong, and the bevel throws them outward. It is not necessary to previously bore a hole for the spike, as it can be driven with the same facility as a common solid spike.



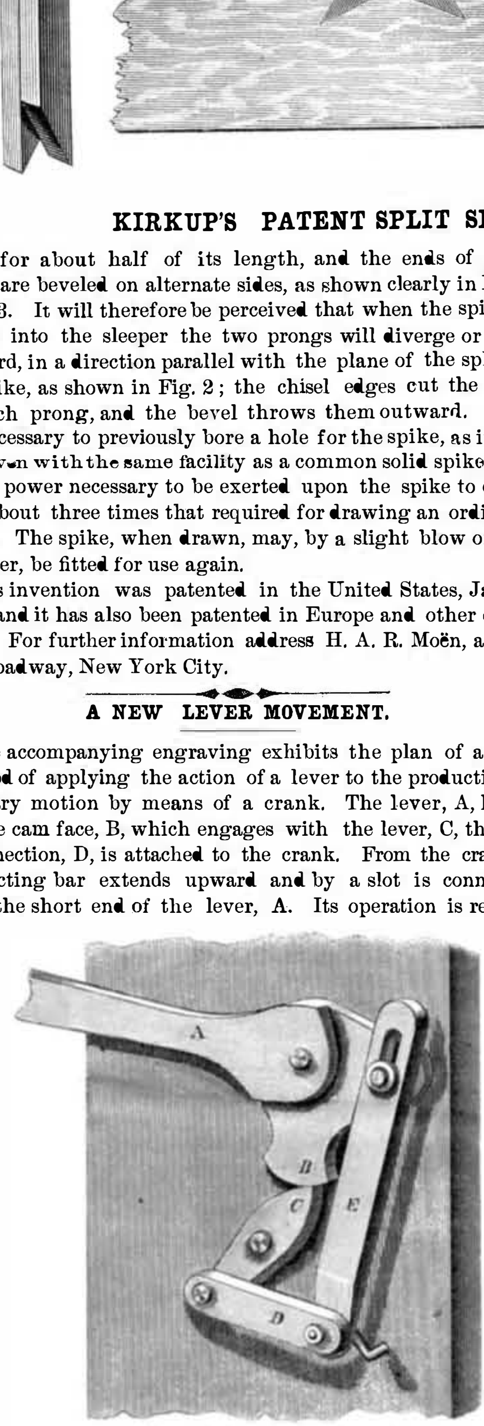
KIRKUP'S PATENT SPLIT SPIKE.

The power necessary to be exerted upon the spike to draw it is about three times that required for drawing an ordinary spike. The spike, when drawn, may, by a slight blow of the hammer, be fitted for use again.

This invention was patented in the United States, Jan. 2, 1866, and it has also been patented in Europe and other countries. For further information address H. A. R. Moën, at No. 71 Broadway, New York City.

A NEW LEVER MOVEMENT.

The accompanying engraving exhibits the plan of a new method of applying the action of a lever to the production of a rotary motion by means of a crank. The lever, A, has a double cam face, B, which engages with the lever, C, that by a connection, D, is attached to the crank. From the crank a connecting bar extends upward and by a slot is connected with the short end of the lever, A. Its operation is readily understood. By raising the lever, A, the point of C slides over the face of B and falls by the weight of the bar, E, beyond the radius, where the front of B takes it and reverses its motion; the bar, E, gradually rising until near the vertical center, when the reciprocating movement of A completes the turn.



As the arrangement is made in the engraving—taken from a simple wood model—gravitation has much to do with its operation, but modifications could undoubtedly be made by which it could operate in any position. The inventor thinks this movement could be readily and usefully applied to the propulsion of hand cars on railroads and for the connections between marine engines and screws. He claims that the power exerted is by this plan applied directly to the crank. Practical mechanics can readily judge of the advantages or merits of this combination of levers and cam. It is the invention of Henry Maas, Homestead, Iowa.

The Teeth.

According to a paper by Dr. Latimer, in the *Dental Cosmos,* a deciduous set of twenty teeth—viz: eight incisors, or cutting teeth, four cuspids, or pointed teeth, and eight molars or grinders—are given to each human being, usually during the two and a half years succeeding the first six months of life. When the jaws are sufficiently grown, and the time approaches for the deciduous set to be replaced by strong and permanent teeth, they lose their roots by absorption, become loose, and work out, one by one. The first four molars, one on each side of each jaw, are usually replaced first, at about five or six years of age. Next them, at 12 to 14 years, appear a second quaternion of molars; and at 17 to 21, a third and entirely new set, making in all twelve. Meanwhile, the new incisors come on, from six to nine, the central ones first, and the cuspids follow, from nine to twelve.

Teeth, nails and hair originate from the skin, and the four in general bear a common family likeness The teeth being in great part composed of phosphate of lime, which is abundantly diffused among vegetable substances by nature, a natural diet nourishes them with their special ingredients. An artificial diet, if not shaped by science as well as the arts, *starves* the teeth by superfining the food of its mineral elements. Wheat deprived of its russet shell by fine bolting, contains little or no strong mineral food for the bony system; but instead of this, we substitute mineral poisons in the bread, which attack the enfeebled teeth with disastrous success.

Microscopic photography has lately been made a valuable auxiliary to the study of the structure and internal economy of the teeth. Very striking exhibitions of the secrets of nature are thus fixed upon paper, and will doubtless become more and more popular in the future. Magnifying glasses of considerable power are also adapted to the use of dentists in examining the teeth and in working out their excavations, fillings and finishings to perfection.

[For the Scientific American.]

SNOW MELTED BY FRICTION--DANGEROUS PAPER.

BY PROFESSOR CHARLES A. SEELEY.

MELTING SNOW BY FRICTION.

Latterly, there is no good sleighing on Broadway. The pleasure sleighs avoid Broadway and seek the avenues, or go beyond the limits of the city. The huge stage-sleighs, drawn by six to twelve horses, and carrying a hundred frolicking passengers, which used to be the most exhilarating incident of the winter on Broadway, now belong to the past. And yet as much snow as ever falls in the winter, and it is never carted away as in some other cities. Lately, the snow, instead of being looked upon as a source of comfort and good humor on Broadway, is pronounced to be a very serious nuisance.

People account for the change by telling us that the great and increasing traffic on Broadway cuts up the snow, and thus spoils it for sleighing. This reason, although good enough for a short one, is not sufficiently specific and comprehensive for the philosopher, or the readers of this paper. It seems to have in view only such evident circumstances as evenness in depth and compactness. I invite attention to a single fact which very few of those who are satisfied with the cutting-up theory have taken into account.

The snow on Broadway does not last so long as in other streets: it actually melts faster there. I have observed that the melting goes on most rapidly in the middle of the street; practically, there is a streak of warmth up and down. Some of the merchants have found out this warm streak, for I have seen men employed pitching the snow into it, that is, under the horses' feet in the carriage path. Wherever this was done, the snow was cleared off the premises very promptly. If the practice were generally adopted from Bowling green to Union square, it would very much diminish the peril of navigating Broadway in winter; shoveling the snow where it will melt, is much better than salting it, as was once the custom here.

But why does the snow melt more rapidly in the carriage way? Is it really warmer there, and why?

There are two reasons which are pertinent to the case, and which perhaps sufficiently explain it. First: The friction in the snow produced by the trampling of horses and the passage of vehicles. Friction always produces heat. Two pieces of ice may be melted by rubbing them together: water which is much agitated is prevented from freezing, and water in a bottle may be boiled by shaking it, provided that the heat produced by the friction be retained in it. I know that a little friction does not produce much heat, that a pound of water requires an expenditure of 772 foot pounds of force to warm it one degree, and that to melt a pound of snow demands 140 times as much. Yet, on the other hand, when we calculate the thousands of tons of horse, man, stage, cart, express wagon, and merchandize, incessantly crushing and stirring up the snow on Broadway, we must conclude that here is a force adequate for a notable result. *Causa aequat effectum.* Second: Absorption of the sun-heat. The sunlight is absorbed and disappears on dark-colored surfaces, and carries all the heat with it: white surfaces reject both. The pure white snow is very slow to melt, because it refuses to take in the heat. Sprinkle ink or lampblack on the snow, and it will melt when the air is below zero, if the bright sunbeams fall on it. The case is plain: the white snow of the side of the street, when thrown in the roadway, becomes inked over with dirt, and now is eager for the sun heat.